PETROGRAPHY AND SEDIMENTOLOGY OF AEOLIAN SANDS: A TOOL TO DIAGNOSE THE SEDIMENTARY DEFICIT IN LA GRACIOSA ISLAND (NATURAL PARK OF ARCHIPIELAGO CHINIO, CANARY ISLANDS, SPAIN)

STUDIED ZONE

The Canary archipelago has mainly beach-dune systems in the eastern islands which present a remarkable ecological (protected natural areas) and economical (tourism industry) interest.

From a geological point of view, La Graciosa is formed by ultramafic and mafic lava flows and pyroclasts, middle Pléistocene and Holocene in age, and the half of its surface is upholstered by sand aeolian deposits.

METHODOLOGY

Over the last decades, some beaches of the island show the evidence of a sedimentary deficit. These sandy environments are essential for the preservation of protected area and for the tourist activity. In this context, research teams are developing several multidisciplinary projects for elaborating a diagnosis on this situation applying a multidisciplinary approaches.

PETROGRAPHIC STUDY

The petrographic results show that the sands contain mainly bioclasts (higher than 75%). These bioclasts (For and FaB) are mainly fragments of seaweed meshes (SiL) and mollusks (M) and, in a minor proportion, foraminiferas (For), equinoderms (equiv), gastropods and bryozos. These bioclasts mainly come from the coastal and shallow platform environments.

SEDIMENTOLOGIC ANALYSES

The sedimentologic analyses confirm that the sands are very well sorted (calcimetric values higher than 84%) and the sand grains have medium size (calcimetric values higher than 84%) and that the sands are very carbonated (calcimetric values higher than 84%).

The sand deficit in the beach-dune systems of La Graciosa could be due to a decrease of beachrock productions less bioclasts grains) by natural or anthropogenic causes such as: global changes of climatic or oceanographic conditions, or local marine water contamination, among others.

The most significant example of sedimentary deficit is in El Salado beach-dune system. Thus, a drastic change of island economy exists in the last decades towards the turistic activity. This implies an important growth of the town of Caleta del Sebo and the building surface has doubled from 1977 to 2009. In addition, there are some illegal sand quarries used for several constructions.

CHARACTERIZATION OF SAND GRAINS AND POSSIBLE CAUSES OF SAND DEFICIT

The sand deficit in the beach-dune systems of La Graciosa could be due to a decrease of beachrock productions less bioclasts grains) by natural or anthropogenic causes such as: global changes of climatic or oceanographic conditions, or local marine water contamination, among others. It is possible to observe that the actual reception of the sand in the studied beaches is minimum if compared with the aeolian sand deposits found in the interior of the island. Thus, beachrock and paleosoil beds, and aeolinites deposits sometimes outcrop on the intertidal and supratidal environments.